Listing of Claims:

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application. Material to be inserted is in **bold and underline**, and material to be deleted is in ~~strikeout~~ or (if the deletion is of five or fewer consecutive characters or would be difficult to see) in double brackets [[ ]]. In brief, previous claims 1-74 have been canceled, now or in response to an earlier restriction requirement, and new claims 75-132 have been added.

1-74. (Canceled)

75. (New) A plate for holding a plurality of samples, comprising:

a frame;

a plurality of sample wells disposed in the frame for holding a corresponding plurality of samples; and

a thermal isolation structure associated with the frame and disposed between the sample wells to reduce thermal transfer between adjacent sample wells, where the thermal isolation structure comprises a thermal barrier disposed between adjacent sample wells to reduce thermal transfer between the adjacent sample wells, the thermal barrier including an infrared-reflective material that reflects at least about half of the thermal infrared radiation incident on the barrier.

76. (New) The plate of claim 75, the frame being substantially rectangular, where the length of the frame ranges between about 125 mm and about 130 mm, and where the width of the frame ranges between about 80 mm and about 90 mm.

77. (New) The plate of claim 75, where the number of sample wells in the plate is selected from the group consisting of 96, 384, 768, 1536, 3456, and 9600.

78. (New) The plate of claim 75, where the density of sample wells in the plate is at least about 1 well per 81 mm^2.

79. (New) The plate of claim 75, where the volume of each sample well in the plate is less than about 500 microliters.

80. (New) The plate of claim 75, where the sample wells and the thermal isolation structure are composed at least in part of different materials.

81. (New) The plate of claim 75, the sample wells having a central axis, where the thermal isolation structure substantially surrounds the central axis of each sample well without obstructing transmission of thermal infrared radiation along the central axis.

82. (New) The plate of claim 75, where the thermal isolation structure comprises a thermal buffer disposed between the sample wells to reduce thermal transfer between adjacent sample wells, the thermal buffer having a higher thermal mass than the sample wells and corresponding samples.

83. (New) The plate of claim 82, where at least a portion of the thermal buffer is a metal.

84. (New) The plate of claim 83, where the metal is aluminum.

85. (New) The plate of claim 82, where at least a portion of the thermal buffer is a high-thermal-capacitance plastic.

86. (New) The plate of claim 82, where the thermal isolation structure further comprises a plurality of isolation wells disposed in the frame, where each of the sample wells is positioned in a corresponding isolation well, and where none of the isolation

wells and sample wells is in fluid contact with another of the isolation wells and sample wells.

87. (New) The plate of claim 82, where the thermal isolation structure further comprises a plurality of isolation wells disposed in the frame, where each of the sample wells is positioned in a corresponding isolation well, and where none of the isolation wells and sample wells is in fluid contact with another of the isolation wells and sample wells.

88. (New) The plate of claim 75, where the reflectivity of the infrared-reflective material is at least about 0.8.

89. (New) The plate of claim 75, where the emissivity of the infrared-reflective material is at most about 0.2.

90. (New) The plate of claim 75, where the infrared-reflective material is selected from the group consisting of AlSiO and gold.

91. (New) The plate of claim 75, the sample wells having a top and bottom, where the tops of the sample wells define a plane, and where each straight line below the plane connecting a portion of one sample well to a portion of an adjacent sample well intersects the thermal barrier.

92. (New) The plate of claim 75, where the thermal isolation structure further comprises a second thermal barrier disposed between adjacent sample wells to reduce thermal transfer between the adjacent sample wells, the second thermal barrier also including an infrared-reflective material that reflects at least about half of the thermal infrared radiation incident on the barrier.

93. (New) The plate of claim 75, where a portion of the frame is disposed between the two thermal barriers.

94. (New) The plate of claim 75, where the thermal isolation structure further comprises a plurality of isolation wells disposed in the frame, where each of the sample wells is positioned in a corresponding isolation well, and where none of the isolation wells and sample wells is in fluid contact with another of the isolation wells and sample wells.

95. (New) The plate of claim 75, further comprising a plurality of trapped volumes corresponding to each sample well, where the trapped volumes are formed between an outer surface of the sample wells and an inner surface of the corresponding isolation wells, the trapped volumes further reducing thermal transfer to and from samples in the sample wells.

96. (New) The plate of claim 95, where the trapped volume includes air.

97. (New) The plate of claim 95, where the trapped volume is at least partially evacuated relative to standard atmospheric pressure.

98. (New) The plate of claim 75, further comprising a cover configured to cover the sample wells, reducing evaporative heat loss from samples contained within the sample wells.

99. (New) The plate of claim 75, further comprising a thermal reference region disposed about the sample wells in the frame, where thermal infrared radiation detected from a sample positioned in at least one of the sample wells may be calibrated using thermal infrared radiation detected from an adjacent thermal reference region.

100. (New) The plate of claim 99, the sample wells having a central axis, where the thermal reference region includes an annular emissive reference surface positioned about the central axis of each sample well.

101. (New) A plate for holding a plurality of samples, comprising:

a frame;

a plurality of sample wells disposed in the frame for holding a corresponding plurality of samples;

a thermal isolation structure associated with the frame and disposed between the sample wells to reduce thermal transfer between adjacent sample wells; and

a plurality of trapped volumes corresponding to each sample well, the trapped volumes further reducing thermal transfer to and from samples in the sample wells, where the trapped volumes are formed between an outer surface of the sample wells and an inner surface of the corresponding isolation wells, and where at least a portion of the trapped volumes are lined by an infrared-reflective material.

102. (New) The plate of claim 101, the frame being substantially rectangular, where the length of the frame ranges between about 125 mm and about 130 mm, and where the width of the frame ranges between about 80 mm and about 90 mm.

103. (New) The plate of claim 101, where the number of sample wells in the plate is selected from the group consisting of 96, 384, 768, 1536, 3456, and 9600.

104. (New) The plate of claim 101, where the density of sample wells in the plate is at least about 1 well per 81 mm^2.

105. (New) The plate of claim 101, where the volume of each sample well in the plate is less than about 500 microliters.

106. (New) The plate of claim 101, where the sample wells and the thermal isolation structure are composed at least in part of different materials.

107. (New) The plate of claim 101, the sample wells having a central axis, where the thermal isolation structure substantially surrounds the central axis of each sample well without obstructing transmission of thermal infrared radiation along the central axis.

108. (New) The plate of claim 101, where the thermal isolation structure comprises a thermal buffer disposed between the sample wells to reduce thermal transfer between adjacent sample wells, the thermal buffer having a higher thermal mass than the sample wells and corresponding samples.

109. (New) The plate of claim 108, where at least a portion of the thermal buffer is a metal.

110. (New) The plate of claim 109, where the metal is aluminum.

111. (New) The plate of claim 108, where at least a portion of the thermal buffer is a high-thermal-capacitance plastic.

112. (New) The plate of claim 108, where the thermal isolation structure further comprises a thermal barrier disposed between adjacent sample wells to reduce thermal transfer between the adjacent sample wells, the thermal barrier including an infrared-reflective material that reflects at least about half of the thermal infrared radiation incident on the barrier.

113. (New) The plate of claim 112, where the thermal isolation structure further comprises a plurality of isolation wells disposed in the frame, where each of the sample wells is positioned in a corresponding isolation well, and where none of the isolation

wells and sample wells is in fluid contact with another of the isolation wells and sample wells.

114. (New) The plate of claim 108, where the thermal isolation structure further comprises a plurality of isolation wells disposed in the frame, where each of the sample wells is positioned in a corresponding isolation well, and where none of the isolation wells and sample wells is in fluid contact with another of the isolation wells and sample wells.

115. (New) The plate of claim 101, where the thermal isolation structure comprises a thermal barrier disposed between adjacent sample wells to reduce thermal transfer between the adjacent sample wells, the thermal barrier including an infrared-reflective material that reflects at least about half of the thermal infrared radiation incident on the barrier.

116. (New) The plate of claim 115, where the reflectivity of the infrared-reflective material is at least about 0.8.

117. (New) The plate of claim 115, where the emissivity of the infrared-reflective material is at most about 0.2.

118. (New) The plate of claim 115, where the infrared-reflective material is selected from the group consisting of AlSiO and gold.

119. (New) The plate of claim 115, the sample wells having a top and bottom, where the tops of the sample wells define a plane, and where each straight line below the plane connecting a portion of one sample well to a portion of an adjacent sample well intersects the thermal barrier.

120. (New) The plate of claim 115, where the thermal isolation structure further comprises a second thermal barrier disposed between adjacent sample wells to reduce thermal transfer between the adjacent sample wells, the second thermal barrier also including an infrared-reflective material that reflects at least about half of the thermal infrared radiation incident on the barrier.

121. (New) The plate of claim 115, where a portion of the frame is disposed between the two thermal barriers.

122. (New) The plate of claim 115, where the thermal isolation structure further comprises a plurality of isolation wells disposed in the frame, where each of the sample wells is positioned in a corresponding isolation well, and where none of the isolation wells and sample wells is in fluid contact with another of the isolation wells and sample wells.

123. (New) The plate of claim 101, where the thermal isolation structure comprises a plurality of isolation wells disposed in the frame, where each of the sample wells is positioned in a corresponding isolation well, and where none of the isolation wells and sample wells is in fluid contact with another of the isolation wells and sample wells.

124. (New) The plate of claim 101, where the trapped volume includes air.

125. (New) The plate of claim 101, where the trapped volume is at least partially evacuated relative to standard atmospheric pressure.

126. (New) The plate of claim 101, further comprising a cover configured to cover the sample wells, reducing evaporative heat loss from samples contained within the sample wells.

127. (New) The plate of claim 101, further comprising a thermal reference region disposed about the sample wells in the frame, where thermal infrared radiation detected from a sample positioned in at least one of the sample wells may be calibrated using thermal infrared radiation detected from an adjacent thermal reference region.

128. (New) The plate of claim 127, the sample wells having a central axis, where the thermal reference region includes an annular emissive reference surface positioned about the central axis of each sample well.

129. (New) A plate device for holding a plurality of samples, comprising:

an insert member defining an array of sample wells, each sample well having a central axis; and

a support member having a thermal isolation framework in a configuration corresponding to the array of sample wells, where when the insert member engages the support member each sample well is thermally isolated from adjacent sample wells without obstructing the transmission of thermal infrared radiation along the central axis of the sample well, and where the thermal isolation framework comprises a thermal barrier disposed between adjacent sample wells to reduce thermal transfer between the adjacent sample wells, the thermal barrier including an infrared-reflective material that reflects at least about half of the thermal infrared radiation incident on the barrier.

130. (New) The plate of claim 129, where the thermal isolation framework comprises a thermal buffer disposed between the sample wells to reduce thermal transfer between adjacent sample wells, the thermal buffer having a higher thermal mass than the sample wells and corresponding samples.

131. (New) The plate of claim 129, where the thermal isolation framework comprises a plurality of isolation wells disposed in the frame, where each of the sample wells is positioned in a corresponding isolation well, and where none of the isolation wells and sample wells is in fluid contact with another of the isolation wells and sample wells.

132. (New) The plate of claim 129, further comprising a cover configured to cover the sample wells, reducing evaporative heat loss from samples contained within the sample wells.